



November 8, 2004

CCN 53364

Mrs. Elizabeth D. Sellers  
Manager  
U.S. Department of Energy  
Idaho Operations Office (NE-ID)  
1955 Fremont Avenue  
Idaho Falls, ID 83401-1203

**CONTRACT NO. DE-AC07-99ID13727 – UPDATE TO INEEL ELECTRICAL SAFETY  
IMPROVEMENT PLAN**

Reference: P. H. Divjak letter to Elizabeth D. Sellers, Electrical Safety Performance Baseline,  
August 3, 2004, CCN 51290

Dear Mrs. Sellers:

Bechtel BWXT Idaho (BBWI) has improved the content and structure of the Electrical Safety Improvement Plan that we provided you on August 3, 2004. The revised plan has been entered into our document control system as PLN-1838.

The plan continues to focus on preventing human errors, eliminating the identified organizational weaknesses and improvements to pre-work planning.

Please find the attached update of the BBWI Electrical Safety Improvement Plan with baseline review data and the areas identified for improvement. We would suggest the tracking of our plan and its status continue to be conducted as an integral activity during DOE's attendance at the Electrical Safety Committee meetings.

Should you have any comments or questions regarding this information and approach please contact me at (208)526-5218.

Sincerely,

Robert F. French, Director  
INEEL ESH&QA

le

Attachment

Mrs. Elizabeth Sellers

November 8, 2004

CCN 53364

Page 2

cc: W. L. Bauer, NE-ID, MS 1221  
S. S. Crawford, INEEL, MS 3810 (w/o Att.)  
P. H. Divjak, INEEL, MS 3898  
P. K. Kearns, INEEL, MS 3898  
R. S. Watkins, INEEL, MS 3898

# Electrical Safety Improvement Plan



Form 412.14  
10/9/2003  
Rev. 05

<b>ELECTRICAL SAFETY IMPROVEMENT PLAN</b>	Identifier:	PLN-1838
	Revision:	0
	Page:	2 of 13

OS&H	Plan	For Additional Info: <a href="http://EDMS">http://EDMS</a>	Effective Date: 11/10/2004
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Change  
Number:

Prepared by:

Greggory K. Christensen



11/8/04

Date

Reviewer:

Blaine T. Atkinson

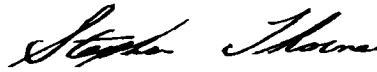
 for

11/8/04

Date

Approver:

Stephen D. Thorne



11/8/04

Date

Approver:

Robert F. French

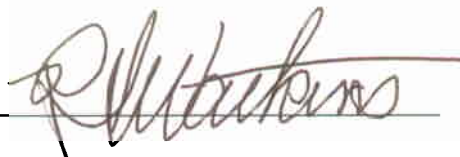


11/8/04

Date

Approver:

Richard S. Watkins



11/8/07

Date

**ELECTRICAL SAFETY IMPROVEMENT PLAN**

Identifier: PLN-1838

Revision: 0

Page: 3 of 13

## 1. Purpose

The Electrical Safety Improvement Plan (ESIP) has been established to provide a path for continuous improvement of the INEEL Electrical Safety Program. Specifically, the ESIP provides the basis to determine if trends, repetitive events or single point failures point to an area for improvement. This plan establishes the scope, objectives and process for evaluating historical data relative to electrical events within the DOE complex as part of our commitment to look for flawed defenses.

## 2. Scope

INEEL ORPS of electrically related events will be reviewed/evaluated for the purpose of determining adequacy of corrective actions to prevent recurrence. Further, all INEEL ORPS shall be reviewed to determine if trends or repetitive events are occurring. Single point failures shall also be evaluated to determine if an improvement area is needed.

Causal analysis reports and interviews will be utilized as a means of ensuring the evaluation is comprehensive and the improvement plan is effective. Reports relative to electrical events within the DOE complex will be reviewed and evaluated as part of our commitment to look for flawed defenses. The ORPs reports shall be presented to the Electrical Safety Committee each month to increase awareness of electrical safety issues that are occurring within the DOE Complex.

## 3. Objectives

The objectives of this plan include:

- Use historical data to identify process weaknesses expressed by past events and target areas for improvement.
- Perform Gap Analysis to compare the historical performance data from the initial performance baseline to specific electrical safety performance goals.
- Identify performance gaps ranked by significance and risk.
- Use Human Performance (HU) techniques to look for latent organizational weaknesses and error likely situations.
- Develop Corrective Actions to formulate appropriate short and long-range process and behavioral actions specifically designed to address gaps identified.
- Establish Electrical Safety Performance Monitoring to enable continuous electrical safety improvement through measurement and control against the established baseline.

**ELECTRICAL SAFETY IMPROVEMENT PLAN**

Identifier: PLN-1838

Revision: 0

Page: 4 of 13

- Develop Electrical Safety Specific performance measures and indicators to allow monitoring against performance objectives.
- Review potential leading indicators for electrical safety and integrate electrical safety into existing observation programs
- Provide briefings with management sponsors on identified gaps and proposed corrective actions

## 4. Goals

The INEEL is dedicated to the concept that all accidents are preventable. Our goal is to achieve and sustain "Zero Accidents" through continuous improvement practices and ensure all operations at the INEEL are performed in a safe, compliant and environmentally responsible manner.

A reduction in the number and severity of electrical events is a near and long term goal.

Severity of events/occurrences shall be evaluated through application of a scale to assign weighting severity.

Administrative	1.0
Loss of Productivity/Equipment Damage	1.5
Procedure violation low hazard	2.0
Near miss	3.0
Shock occurs – no injury	4.0
Electrical injury	5.0-9.0
Death	10.0

### Examples for application of weighting:

Administrative (Paper or form discrepancy with no hazard potential)  
 Loss of productivity/Equipment Damage (No personnel hazard potential)  
 Procedure violation (Low hazard potential)  
 Near Miss (By definition)  
 Electrical injury (Shock/Burn – weighting based on injury severity)

**ELECTRICAL SAFETY IMPROVEMENT PLAN**

Identifier: PLN-1838

Revision: 0

Page: 5 of 13

An Annual Severity Indicator (ASI) is obtained when each event is weighted for severity and then averaged to obtain a single number representing performance. The ASI is graded as follows.

Excellent	2.9 or less
Good	3.0 – 3.9
Fair	4.0 – 4.9
Poor	5.0 or greater

Any improvement in safety performance will be considered successful in terms of yearly performance. An Overall Severity Indicator (OSI) of 2.65 was calculated from performance baseline data. A comparison of the OSI to the ASI shall be performed to determine if the goal for continuous improvement is being met. An occurrence that results in electrical injury would be considered unsatisfactory performance for the year. As a stretch goal, a 5% reduction in the ASI will be sought.

NOTE: ORPs reportable events represent a means to compare DOE sites across the complex. Although an event rate would provide a more meaningful comparison, this would require tabulation of man-hours spent doing electrical work in order to normalize the data. As indicated by the DOE-HQ findings, a substantial number of events involve non-electrical workers. Analyses of this performance indicator to include project/man-hours would provide normalized data, however tabulation is considered difficult, if not infeasible.

## **5. Responsibilities**

The Electrical Safety Committee (ESC) shall be responsible for the administration of this plan. A team consisting of members of the ESC and a person trained in HU approved by senior management shall be assigned responsibilities for the performance of the objectives of this improvement plan, documentation and submittal of results. In accordance, with the philosophy toward “Zero Accidents”, the Team will provide proactive stewardship of the Electrical Safety Improvement Plan with a focus on near and long term planning for continuous improvement.

## **6. Electrical Safety Performance Baseline**

An evaluation of historical data was performed in FY 2004 to identify opportunities for improvement and special focus areas relative to electrical safety. The initial performance baseline includes a review of events occurring from May 2002 to May 2004. Historical data was reviewed, compared and contrasted relative to activity, who, where, consequence, task, and cause. The results indicated unintentional human errors caused the majority of events and there is a normal distribution on who/where and performance mode. Charts relative to this evaluation are incorporated into Section 9, Tables.

**ELECTRICAL SAFETY IMPROVEMENT PLAN**

Identifier: PLN-1838

Revision: 0

Page: 6 of 13

Electrical Safety Improvement Plan				
	Activity	Start	Finish	Status
1	Evaluate Historical Data			
1.1	Identify ORPS electrical events			complete
1.2	Develop draft data bins			complete
1.3	Establish ESC sub-team			complete
1.4	Sub-team review of events			
1.4.1	Member review and binning	18-May	31-May	complete
1.4.2	Follow-up information / interviews	26-May	31-May	complete
1.4.3	Sub-team trending and binning mtg	1-Jun	1-Jun	complete
1.5	Draft report of data review			
1.5.1	Develop Draft	2-Jun	7-Jun	complete
1.5.2	ESC review of draft	9-Jun	9-Jun	complete
1.6	MILESTONE #1 - verbal outbrief w/ sponsors	15-Jun	15-Jun	complete
2	Develop Improvement Plan			
2.1	Draft Improvement Plan	1-Jun	8-Jun	complete
2.2	ESC Review	9-Jun	9-Jun	complete
2.3	MILESTONE #2 - Verbal outbrief w/ sponsors			
3	Establish Electrical Safety Performance Monitoring			
3.1	Develop specific ES measures and indicators	19-Jul	11-Aug	complete
3.2	Baseline against other DOE sites (ESC conference)	26-Jul	29-Jul	complete
3.3	DOE handbook final working meeting	16-Aug	19-Aug	cancelled
4	Final report and outbrief			
4.1	Prepare final report	19-Jul	12-Aug	complete
4.2	ESC Review	18-Aug	18-Aug	complete
4.3	MILESTONE # 3 Senior Management / DOE outbrief	25-Aug	25-Aug	complete

The initial data evaluation indicated

1. Human error caused the majority of events primarily due to misinterpretation of requirements and expectations.
2. Latent organizational weaknesses contributed to the events and included poor work instructions, pre-job brief deficiencies and communication problems.
3. Pre-work planning for low risk tasks has not been sufficient to ensure successful operations.

Other areas with latent weaknesses included:

1. GFCI Testing
2. Pre-use cord and tool inspections
3. Personal Safety Grounds
4. Electrical Safety For Operators - Switching operations
5. General Employee Electrical Safety Awareness

In accordance with the plan to eliminate latent organizational weaknesses, prevent human error and improve pre-work planning, corrective actions are being tracked external of this document.



**ELECTRICAL SAFETY IMPROVEMENT PLAN**

Identifier: PLN-1838

Revision: 0

Page: 7 of 13

Over 80% of all accidents can be attributed to human error. Therefore, incorporation of human error reduction into company core processes is essential as part of the ESIP goal to reduce occurrences and the overall company goal to achieve and sustain "Zero Accidents" through continuous improvement practices. The following conditions are associated with human error (not all inclusive)

- Organizational weaknesses
- Procedure/Requirements ambiguity
- Training inadequacy
- Human performance issues
- Management issues
- Work planning issues
- Employee perceptions
- Indistinct problem solving skills
- Lack of hazard recognition
- Cultural issues

A comprehensive effort to incorporate human error reduction into company core processes is being pursued. The error precursors identified in INPO information serve as a focal point to evaluate/screen program elements:

A review of occurrences, performance indicators and measures will be performed on an annual basis to evaluate effectiveness of corrective actions.

## **7. Definitions**

**Electrical Event.** An electrical event is an unintended intrusion into a shock or flash protection boundary by personnel, tool, equipment, or vehicle. Events specific to electrical energy or apparatus such as catastrophic equipment failure are included in this definition.

## **8. Project File Requirements**

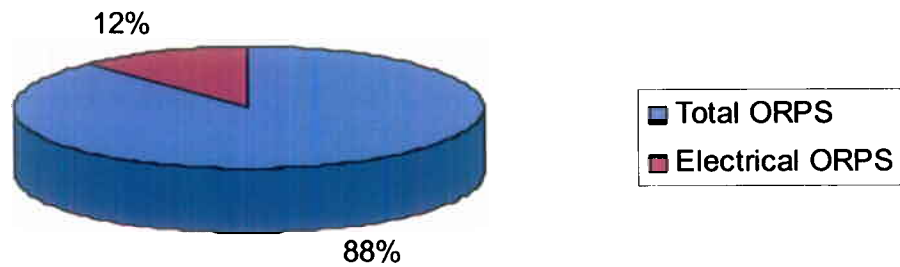
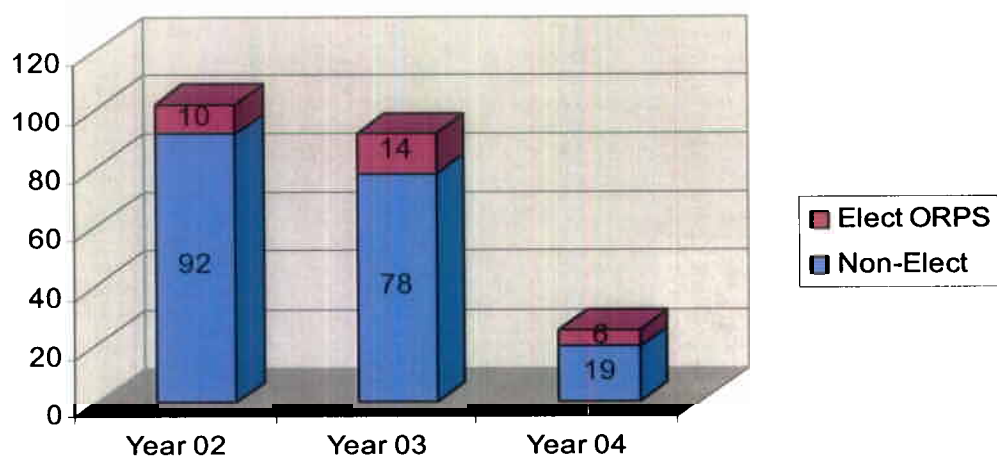
Documentation of evaluations, performance monitoring, associated with the ESIP shall be retained in accordance with records filing requirements. Records will be stored in a lockable file drawer or metal cabinet that would prevent damage or loss of the documentation. Normally, document file information shall be stored together in one place.

**ELECTRICAL SAFETY IMPROVEMENT PLAN**

Identifier: PLN-1838

Revision: 0

Page: 8 of 13

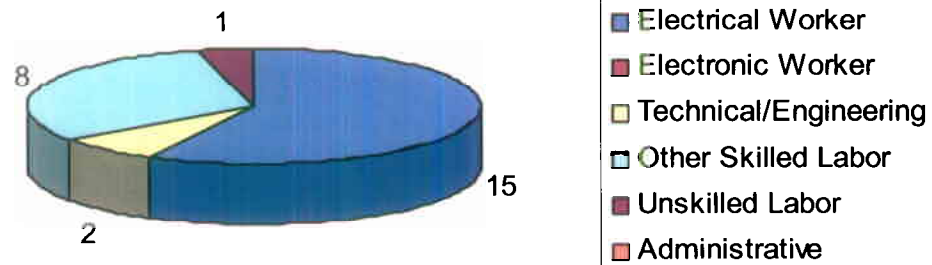
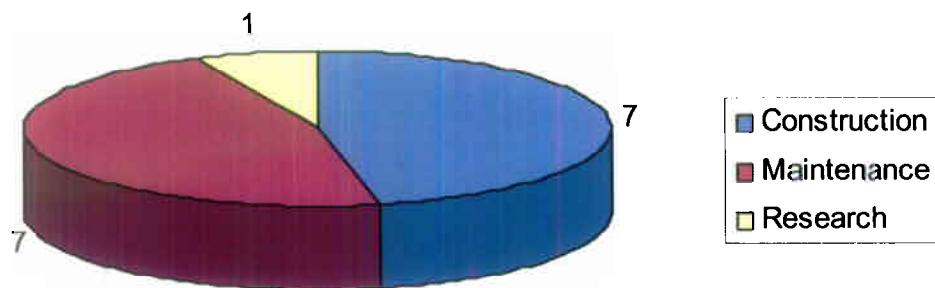
**9. Tables****Elect vs All ORPS (02 - 04)****Elect vs Non-Elect ORPS**

**ELECTRICAL SAFETY IMPROVEMENT PLAN**

Identifier: PLN-1838

Revision: 0

Page: 9 of 13

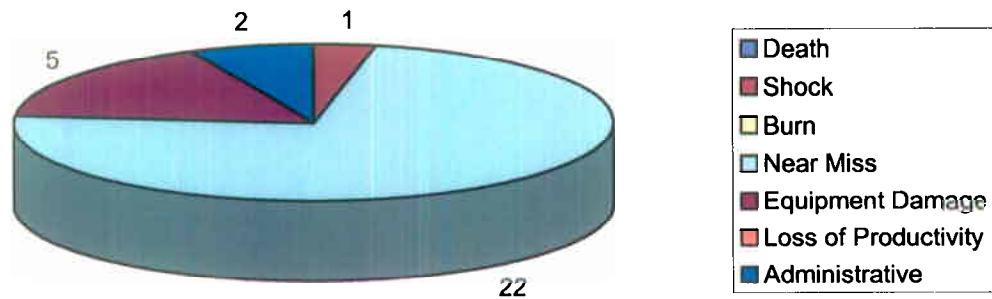
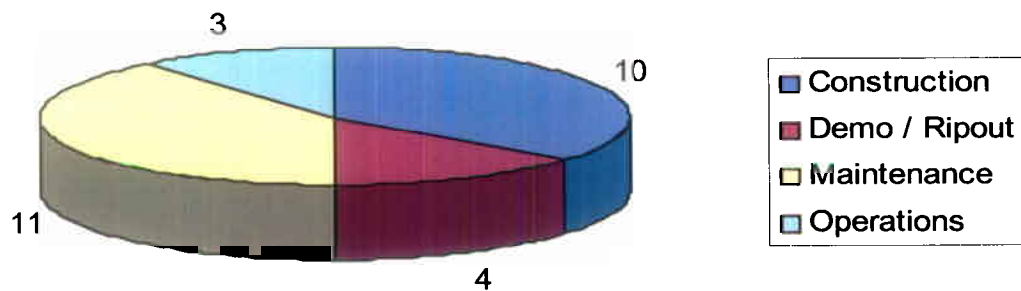
**Who****Specific Electrical Workers**

**ELECTRICAL SAFETY IMPROVEMENT PLAN**

Identifier: PLN-1838

Revision: 0

Page: 10 of 13

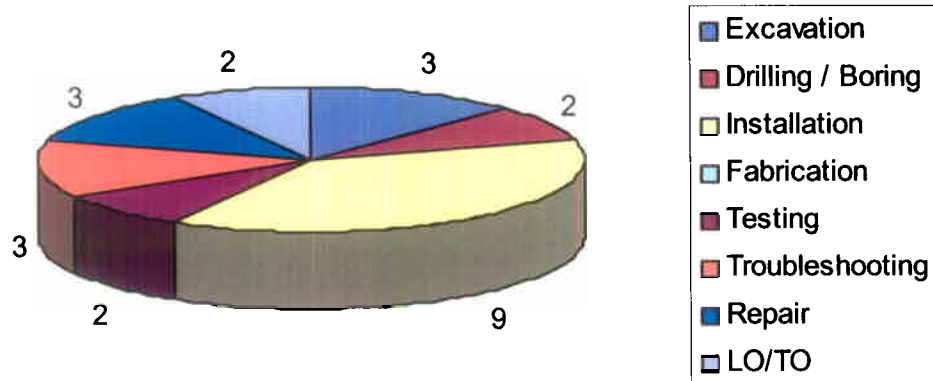
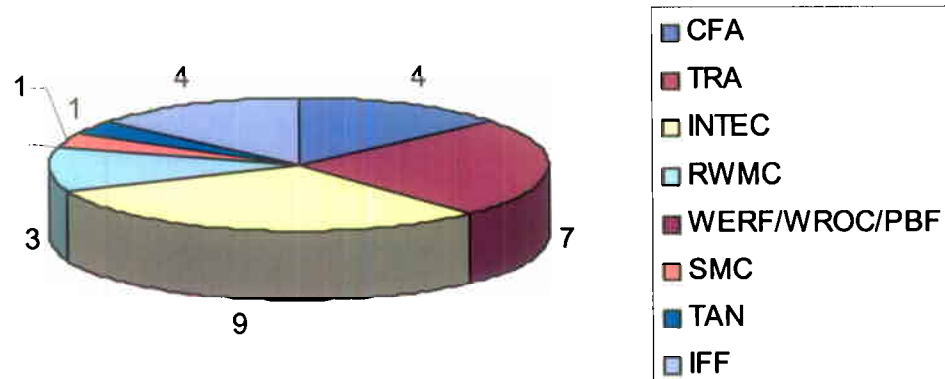
**Consequences****Activity**

**ELECTRICAL SAFETY IMPROVEMENT PLAN**

Identifier: PLN-1838

Revision: 0

Page: 11 of 13

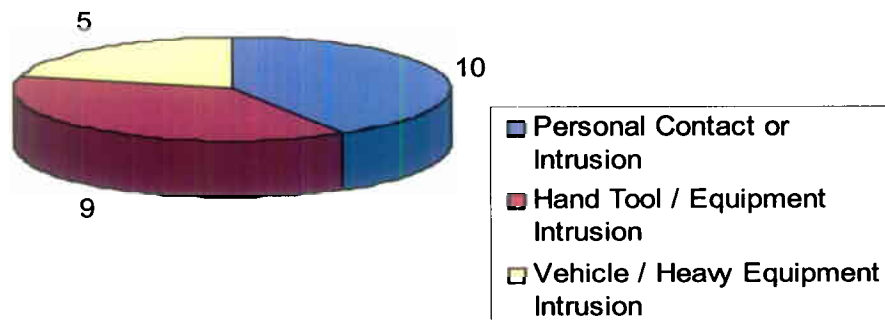
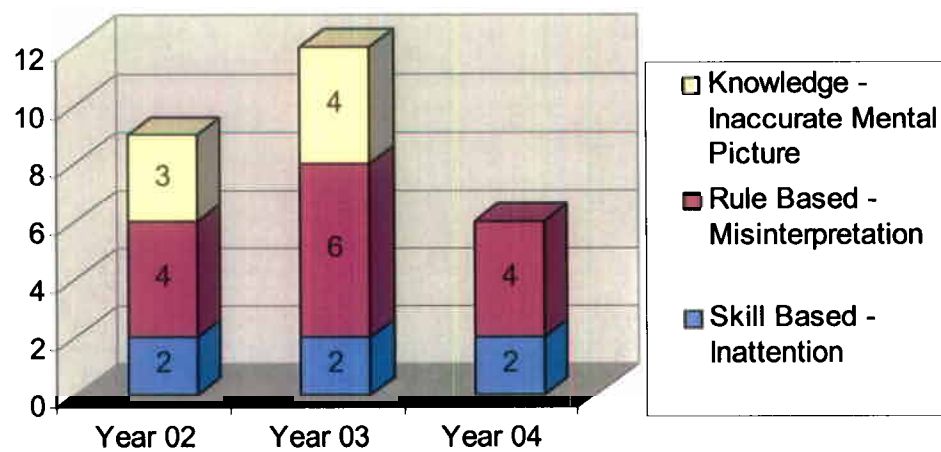
**Specific Task****Where**

**ELECTRICAL SAFETY IMPROVEMENT PLAN**

Identifier: PLN-1838

Revision: 0

Page: 12 of 13

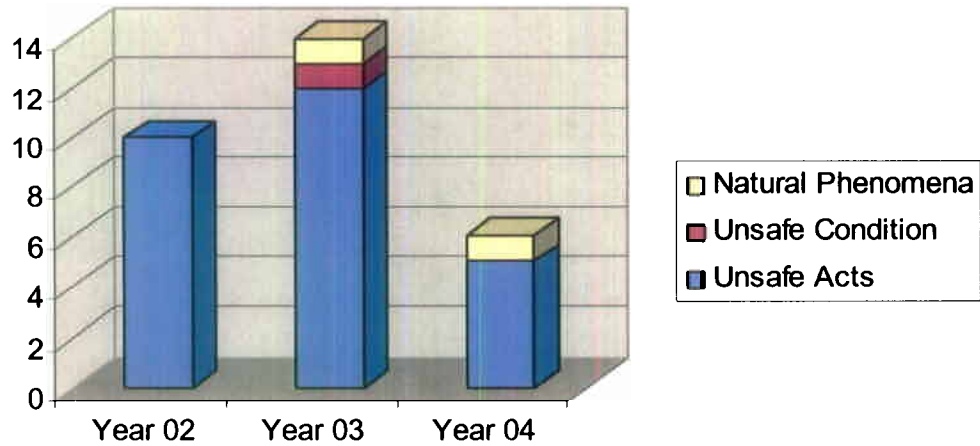
**Direct Cause****Performance Modes Evaluation**

**ELECTRICAL SAFETY IMPROVEMENT PLAN**

Identifier: PLN-1838

Revision: 0

Page: 13 of 13

**Acts vs Conditions****Cause Explanation / Corrective Actions**